

REMARKS

This is intended as a full and complete response to the Final Office Action dated April 23, 2003, having a shortened statutory period for response set to expire on July 23, 2003. Claims 1, 13, 32, 51, 53, 55, 62, 63 and 71 have been amended. Claim 60 has been cancelled. Claims 1-59 and 61-72 remain pending after entry of this response. Please reconsider the claims pending in the application for reasons discussed below.

The specification has been amended to reflect the current status of the applications referenced therein.

Specification

Per the Examiner's request, the specification (Substitute Specification filed December 18, 2002) has been amended to reflect the current status of referenced applications.

Substance Of Examiner Interview

The following is a summary of the Substance of An interview with the Examiner conducted on July 24th with the Examiner, Examiner's Supervisor, and Applicants' representatives (Matt Patterson and Gero McClellan).

Examiner's Office Action was addressed for clarity as to Examiner's rejection of claims 1, 32 and 37. Examiner rejected the claims to show the features of the '197 having certain overlapping features with the '130 patent. Applicant's representatives showed distinctions between '197 and '130 to be wavelength determination, phase shift determination and temporal detection distinctions. The use of broadband and narrowband light sources for the grating operation of the references and application were addressed. Proposals were discussed to include the phase shift determinations and temporal detection distinctions of distinguish the claims.

35 U.S.C. § 112

Claims 52 and 71 stand rejected under 35 U.S.C. § 112. The Examiner states that it is not clear how the acoustic disturbance in a fluid could travel at the speed of the fluid. Applicants assume the Examiner mistakenly referred to claim 52 instead of claim 51. Applicants have amended claims 51 and 71, in an effort to provided clarification.

35 U.S.C. § 103

Claims 1-72 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Kersey*, U.S. Patent No. 5,987,197 ("*Kersey '197*") in view of *Kersey*, U.S. Patent No. 5,361,130 ("*Kersey '130*") and Applicant's admission of prior art. The Examiner states that *Kersey '197* discloses combining first and second light pulses onto a single optical fiber; directing the pulses through a first periodic grating of low reflectivity, through an optical sensor, and through a second periodic grating of low reflectivity; and receiving reflected pulses from the gratings by combining reflected pulses. However, *Kersey '197* does not teach splitting the light pulses into first and second light pulses, delaying one pulse in relation to the other and then directing the split pulses through a fiber optic sensor, and then determining a phase shift between the reflected first light pulse and second grating and the reflected second light pulse and first grating.

The Examiner further states that *Kersey '130* teaches a pulsed sensor system and an interferometric device with a path length difference positioned after a light source and before a sensor system as interchangeable with a system wherein an interferometer is used after light passes through a sensor system. Therefore, the Examiner concludes it would have been obvious to reposition the interferometer of *Kersey '197* (shown located between the sensor system and signal processing circuitry) to be located between the light source and sensor system, to arrive at the inventions as claimed in the present application.

Applicants respectfully traverse this rejection. As stated in *ACS Hospital Systems, Inc. v. Monteforie Hospital*, 221 U.S.P.Q. 929 (C.A.F.C 1984):

"Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. Under section 103, teachings of references can be combined only if there is some suggestion to do so."

Applicants respectfully submit that there is no suggestion or motivation provided in either reference, as required to properly combine the two references as suggested in the Office Action. In fact, Applicants submit that the references teach two fundamentally different sensing approaches that teach away from the combination suggested in the Office Action.

The sensing system disclosed in *Kersey '130* is configured to sense changes in the wavelengths of light reflected by Bragg gratings (FBGs). These changes in wavelength are caused by measurand-induced strain on the FBGs and are extracted from measurable changes in phase shifts between successive pulses reflected from a single FBG. Accordingly, in order to detect changes in wavelength of the reflected light, the interrogating light pulses must originate from a broadband light source spanning at least the range of changes in wavelength (see col. 2, line 42-49).

In contrast, the sensing system of *Kersey '197* is configured to sense changes in the arrival time (i.e., temporal changes) of first and second portions of a light pulse reflected from a pair of sensors (which may be FBGs). *Kersey '197* discloses an interferometer array topology for minimizing common wavelength topology by splitting light returning from a sensor and directing the light to a post-compensating interferometer.

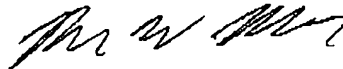
As the sensing systems of *Kersey '130* and *Kersey '197* operate according to fundamentally different principals (i.e., determining changes in wavelength versus determining temporal changes) and solve fundamentally different problems (i.e., sensor sensitivity versus common wavelength cross-talk), Applicants submit that it would not have been obvious, in light of *Kersey '130*, to reposition the interferometer of *Kersey '197* to be located before the sensor system, as suggested in the Office Action (see p. 11, lines 6-8). Therefore, Applicants submit that independent claims 1, 13, 32, and 53, as well as their dependents, are patentable over *Kersey '197* in light of *Kersey '130*. Accordingly, Applicants respectfully request removal of this rejection and submit that all claims are now in condition for allowance.

The prior art made of record is noted. However, it is believed that the secondary references are no more pertinent to the Applicants' disclosure than the primary references cited in the office action. Therefore, it is believed that a detailed discussion of the secondary references is not deemed necessary for a full and complete response to this office action.

Conclusion

In conclusion, the references cited by the Examiner, neither alone nor in combination, teach, show, or suggest the method or apparatus of the present invention. Having addressed all issues set out in the office action, Applicants respectfully submit that the claims are in condition for allowance and respectfully request that the claims be allowed.

Respectfully submitted,



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